(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :16/10/2023

(21) Application No.202321070260 A

(43) Publication Date : 22/12/2023

(54) Title of the invention : OPTIMIZED POLYVINYL ALCOHOL: POLYACRYLIC ACID NANOFIBER FORMULATION FOR PROLONGED RELEASE OF CAPECITABINE AND EVALUATION OF ITS IN VITRO COLON CANCER EFFICACY

(51) International classification :A61P0035000000, A61K0009000000, A61K0009510000, A61P0029000000, A61K0009160000

(86) International Application No :NA
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

(71)**Name of Applicant :**

1)Prof. Dr. Bhusnure Omprakash Gadgeppa
Address of Applicant :Professor and Director, Research Center, Department Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin: 413512, Maharashtra, India. ---------- ----------

2)Mr. Swami Shailesh Anil

3)Prof. Dr. Mani Ganesh

4)Dr. Gholve Sachin Bha

5)Dr. Giram Padmaja Sidram

6)Dr. Jayabalan Jayaprakash

7)Dr. Hemalatha Pushparaj

8)Prof. Dr. Mahesh Palkar

Name of Applicant : NA

Address of Applicant : NA

(72)**Name of Inventor :**

1)Prof. Dr. Bhusnure Omprakash Gadgeppa
Address of Applicant :Professor and Director, Research Center, Department Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin: 413512, Maharashtra, India. ---------- ----------

2)Mr. Swami Shailesh Anil
Address of Applicant :PG Student, Department Pharmaceutical Chemistry, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin: 413512, Maharashtra, India. ---------- ----------

3)Prof. Dr. Mani Ganesh
Address of Applicant :Professor, Department Pharmaceutical Chemistry, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin: 413512, Maharashtra, India. ---------- ----------

4)Dr. Gholve Sachin Bha
Address of Applicant :Associate Professor, Department Pharmaceutical Chemistry, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin: 413512, Maharashtra, India. ---------- ----------

5)Dr. Giram Padmaja Sidram
Address of Applicant :Associate Professor, Department Pharmacology, Channabasweshwar Pharmacy College (Degree), Kawa Road, Basweshwar Chowk, Latur, Pin:413512, Maharashtra, India. ---------- ----------

6)Dr. Jayabalan Jayaprakash
Address of Applicant :Professor, Department of Microbiology, St. Joseph's College of Arts and Science (Autonomous), Cuddalore, Pin: 607001 Tamil Nadu, India. ---------- ----------

7)Dr. Hemalatha Pushparaj
Address of Applicant :Associate Professor, Department of Chemistry, Anna University, Chennai, Pin: 600025, Tamil Nadu, India. ---------- ----------

8)Prof. Dr. Mahesh Palkar
Address of Applicant :Professor, Shobhaben Pratapbhai Patel School of Pharmacy & Technology Management SVKM's Narsee Monjee Institute of Management Studies University (NMIMS), V. L. Mehta Road, Vile Parle (W), Mumbai, Pin:400056, Maharashtra, India. ---------- ----------

(57) Abstract :
Optimized polyvinyl alcohol: polyacrylic acid nanofiber formulation for prolonged release of capecitabine and Evaluation of its in vitro colon cancer efficacy Abstract This study aimed for the development of efficient nanofibers (NFs) formulation using polyvinyl alcohol (PVA) and polyacetic acid (PAA) composites polymers and to embed and release of capecitabine (CPB) a promising anticancer drug targeting colon cancer. The Box–Behnken factorial design was used to analyze the effects of the formulation variables on the NF diameter and study the prolonged drug-release performance. Physicochemical characterizations, such as UV-Visible spectroscopy, Fourier-transform infrared (FTIR) spectroscopy, scanning electron microscopy (SEM), differential scanning calorimetry (DSC), and powder X-ray diffraction (PXRD), were used to evaluate the formulated NFs. The FTIR results showed effective drug loading into the NF matrices, decrease in CPB crystalinity peak in PXRD results further support effective CPB loading. The drug-release study results showed that the drug-loaded NFs exhibited an initial burst release of 41.49%, followed by slow unrelenting release for over 20 h via Fickian diffusion, with n>0.5 to drive controlled drug release through a combination of diffusion and erosion mechanisms. In vitro cyctotoxicity evaluations drug loaded NF on HT-29 colon carcinoma cancer cells showed an enhanced inhibition HT-29 cells compared free drug. Results of the study portrayed the successful formulation of CPB encapsulated PVA:PAA nanofibers for the effective targeted therapy of colon cancer

No. of Pages : 29 No. of Claims : 7